
Online Virtual Team Collaboration Platform
with 3D Graphics

Duygu ATILGAN  1394667
Nilgün DAĞ  1394857
Aslı ÖZAL  1514868
Bahadir ÖZDEMİR  1395342

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# Table of Contents

1 Introduction ................................................................................................................................. 3  
  1.1 Saviour ...................................................................................................................................... 3  
  1.2 Overview of Simulation Scenario .............................................................................................. 3  
  1.3 System Requirements.................................................................................................................. 3  
  1.4 Installation ................................................................................................................................. 3  
  1.5 Executing the Simulation ........................................................................................................... 3  
2 Simulation Menus .......................................................................................................................... 3  
  2.1 Main Menus ............................................................................................................................... 4  
    2.1.1 Main Menu ........................................................................................................................... 4  
    2.1.2 Trainee Menu ....................................................................................................................... 4  
    2.1.3 Facilitator Menu .................................................................................................................. 4  
    2.1.4 Pause Menu ......................................................................................................................... 4  
  2.2 In-Simulation Menus .................................................................................................................... 5  
    2.2.1 User Overlays ...................................................................................................................... 5  
    2.2.2 Fire-fighter In-Simulation Menu ......................................................................................... 5  
    2.2.3 Medical In-Simulation Menu ............................................................................................. 5  
    2.2.4 Search & Rescue In-Simulation Menu ................................................................................. 5  
    2.2.5 Facilitator In-Simulation Menu .......................................................................................... 5  
3 Controls ........................................................................................................................................... 6  
  3.1 Mouse ......................................................................................................................................... 6  
  3.2 Keyboard .................................................................................................................................... 6  
4 Training in the Simulation ............................................................................................................... 6  
  4.1 General ....................................................................................................................................... 6  
  4.2 Camera ....................................................................................................................................... 6  
5 Simulation Content ........................................................................................................................ 7  
  5.1 Team Chiefs .............................................................................................................................. 7  
    5.1.1 Fire-fighter Chief .................................................................................................................. 7  
    5.1.2 Medical Chief ..................................................................................................................... 7  
    5.1.3 Search and Rescue Chief .................................................................................................... 7  
  5.2 3D Environment of Simulation .................................................................................................. 7  
  5.3 Map ........................................................................................................................................... 7  
6 Troubleshooting ............................................................................................................................ 8
1 Introduction

1.1 Saviour

The project ‘Saviour’ is a well-defined, realistic disaster management simulation. It is an online team collaboration platform simulating an abstract model of real-life situation; “evacuation after a disaster”.

The content of Saviour is developed following the properties of a simulation program. The user of Saviour is required to accomplish given tasks using limited resources and in specified time by collaborating with other users. Each user is challenged by different conditions and situations. User’s knowledge about the situation and the usage of these resources under certain conditions are being tested throughout the simulation.

1.2 Overview of Simulation Scenario

The scenario of Saviour takes place in the three areas of METU Campus, which are: Dormitories’ Area, Mall Area and Engineering Area. A disaster happens in the campus, and there are several fires in the campus, i.e. Dormitory 5, The Ebi Mall, and Industrial Eng. Building. There are many injured people and dead people. To sum up, after the disaster, people are needed to be treated and transported to safety regions. The users of simulation are in charge of everything in the campus. They are expected to rescue people, extinguish fires and take control of the area.

Users are the chiefs of three main units: Medical Unit, Search & Rescue Unit and Fire-fighter Unit. Each chief has to accomplish his tasks in collaboration with other chiefs.

1.3 System Requirements

Hardware Requirements:
- CPU: Intel Pentium 4.3GHz (Recommended: Intel Core 2 Duo)
- RAM: 512MB (recommended: 1GB)
- VGA: 128 MB Memory with Hardware support (Preferred: 256 MB)
- HDD: 250MB Free
- Monitor: Resolution 1024x768

Software Requirements:
- OS: Windows XP SP 2 or Windows Vista
- Network: Modem or Ethernet Card with Internet Connection
- Other: DirectX v9.0, OpenAL drivers, Microphone, Speaker, Keyboard & Mouse

1.4 Installation

Saviour can be downloaded from Spongesoft website (http://senior.ceng.metu.edu.tr/2008/spongesoft/spongy_web), or can be installed from CD. The installer will start automatically when the SaviourSetup_v1.0.msi is double-clicked or when the CD is inserted. The instructions of installer should be followed then.

1.5 Executing the Simulation

The simulation can be started by double-clicking savior.exe created after the installation.

2 Simulation Menus

Graphical user interfaces of the Saviour can be grouped into menu interfaces and in-simulation interfaces. Menu interfaces are join simulation menu, create new simulation menu and create new scenario menu. In-program interfaces are different for each user according to his role in the program.
2.1 Main Menus

2.1.1 Main Menu

From the main menu of Saviour, user may select his role in the simulation by clicking on the picture of the desired role (Fire-fighter, Medical, Search & Rescue, or Facilitator), and clicking to ‘Go’ button. If facilitator role is chosen, user is directed to facilitator menu. Otherwise, he is directed to trainee menu.

2.1.2 Trainee Menu

✓ Join Simulation: Joins to a simulation created by another machine.
  o Enter Server IP Address: IP of the server that the simulation is created should be entered.
✓ Simulation Guide: Informs user about Saviour.
✓ Audio Options: Adjusts the levels of audio in the simulation.
  o Background Sound
  o Simulation Effects’ Sound
  o Microphone Sound
✓ Exit: Exits the simulation and terminates the program execution.

2.1.3 Facilitator Menu

Facilitator menu has several submenus to create the simulation environment. The main menu options for facilitator are listed above. Details of the submenus are listed in the order they are displayed.

✓ Create New Simulation: Directs the facilitator to create the environment (to edit buildings’ and civilians’ properties).
  o Create Buildings: By choosing a region and a building in that region, the properties of the building can be set.
  o Create Civilians: By choosing a region and a civilian in that region, the properties of the civilian can be set.
✓ Simulation Guide: Informs user about Saviour.
✓ Audio Options: Adjusts the levels of audio in the simulation.
  o Background Sound
  o Simulation Effects’ Sound
  o Microphone Sound
✓ Exit: Exits the simulation and terminates the program execution.

2.1.4 Pause Menu

✓ Resume Simulation: Resumes the simulation from the point left.
✓ View Current Scores: Current scores displayed for each trainee is different than others.
  o For Fire-fighter:
    ▪ Number of fires increased
    ▪ Number of fires decreased
    ▪ Right resource usage
    ▪ Total Score is displayed.
  o For Medical:
    ▪ Number of people healed
    ▪ Number of people worsen
    ▪ Right resource usage
    ▪ Total Score is displayed.
  o For Search & Rescue:
    ▪ Number of people rescued
    ▪ Number of people died
Right resource usage
Total Score is displayed.
  o For Facilitator: all of the scores for three trainees are displayed.
✓ Exit Simulation: Exits the simulation and terminates the program execution.

2.2 In-Simulation Menus

The menus displayed for each unit chief is different. However, there are several overlays displayed throughout the execution, to inform trainees about the current situation. These overlays are same for all users. Overlays are described in section 2.2.1 and different in-simulation menus are explained in the sections following.

2.2.1 User Overlays

There are three overlays in Saviour:

1. **Selected Item Overlay:** Displays the information about the building or the civilian selected by mouse clicking.
2. **Actor Event Overlay:** Displays the current events in the simulation such as fire increases, teleported areas, right resource usage, etc.
3. **Audio Overlay:** Displays the current speakers in the simulation.

2.2.2 Fire-fighter In-Simulation Menu

Fire-fighter has only a resource usage menu in the simulation. After picking a building in the area, and by pressing ‘R’ button, he can choose the fire extinguisher number, staff number, and the fire-fighting vehicle number to assign that building.

2.2.3 Medical In-Simulation Menu

Medical unit has three different in-simulation menus, explained below.

1. **Ask Question Menu:** Medical chief may ask respiration rate, consciousness, and pulse rate of a civilian in order to decide the patients’ triage class.
2. **Make Triage Menu:** Assigns a black, red, yellow or green triage group to selected civilian.
3. **Use Resource Menu:** Similar to other trainees, the medical chief may decide on the number of resources he will use on a patient. These resources are: defibrillator, oxygen mask, stretcher, bandage, intravenous solution, ambulance, and staff.

2.2.4 Search & Rescue In-Simulation Menu

Search and Rescue has also only a resource usage menu in the simulation. After picking a building or a civilian in the area, and by pressing ‘R’ button, he can choose the dog number, stretcher number, and the staff number to assign that item.

2.2.5 Facilitator In-Simulation Menu

There are several buttons in the facilitator menu explained below:

✓ **Set Building Properties:** During the simulation, the properties of the picked building can be reset as in the beginning of the simulation.
✓ **Set Actor Properties:** The properties of the civilian can be reset during the execution.
✓ **Use Fire-fighter Resources, Use Medical Resources, and Use Search & Rescue Resources:** Facilitator has rights to use the trainees’ resources similar to trainees.
✓ **Set Fire-fighter Resources, Set Medical Resources, Set Search & Rescue Resources:** Facilitator can change the number of resources for each trainee in the program.
3 Controls

3.1 Mouse

Mouse is used for several functions. Right button of the mouse directs the user’s view of environment to right or left. Left button of the mouse is used to pick a building or a civilian in 3D environment.

3.2 Keyboard

Keyboard controls are as follows:

- W: Move forward
- S: Move backward
- A: Move left
- D: Move right
- R: Use resource
- T: Set triage class for civilian (For medical chief)
- Y: Ask question to selected civilian (For medical chief)
- M: Move the selected civilian (For search and rescue chief)
- N: Create a triage area (For medical chief)

4 Training in the Simulation

4.1 General

After the simulation is created, each trainee has to accomplish the tasks related to his role. The users are expected to collaborate with each other vocally and to perform the following tasks in general:

- To have situational awareness (to know what is going on so that to be able to figure out what to do.)
- To rescue as many people as possible, and to minimize the total damage.
- To finish his own tasks in a reasonable time.

When the simulation starts, all users have can interact with the 3D environment of the simulation; the buildings and the civilians in the area. User may explore the area he has started or may teleport to other regions. Also, the user can perform specific actions related to his role. Fire-fighter chief may select a building and use resource on it. Medical unit chief may pick civilians, ask about patients’ health situation and may set the triage class for that patient. Also, he can create a new triage area. The search and rescue team chief can then move injured people to triage areas so that medical chief may be able to treat them. The main issue for all users is to do their tasks in certain time. Fire-fighter should distinguish the fires before it grows more, and the medical should make triage before some people die.

4.2 Camera

Users of Saviour view the 3D environment of METU Campus from first person view.
5 Simulation Content

5.1 Team Chiefs

Chiefs of each unit have ability to move, select an item in the environment (building or civilian), use resource, and talk vocally with other users.

The abilities of each chief specific to their roles are given in detail in following sections.

5.1.1 Fire-fighter Chief

Chief of firefighting unit has the responsibility to extinguish fires in the area. Since fire may spread around, he has to be quick and has to direct his staff effectively. His main tasks are to extinguish fire, to take precautions to prevent fire, and to notify other units – especially medical unit in case of injured civilians. To do these tasks, he can first gather information about the building and the fire, and then assign resources to that fire. Considering each fire will have different properties, each one requires different materials to be used, and chief should have knowledge about the kinds of extinguishers and their usage areas.

5.1.2 Medical Chief

When medical unit comes to the area, medical unit chief can create a new triage area. Then, he can get information about consciousness, respiration rate, and circulation information of the patients he has chosen. After that, he can classify the patient according to his situation. When search and rescue team has moved the patient to triage area, he may be able to use resource on the patient and treat them.

5.1.3 Search and Rescue Chief

Search and rescue chief can walk through the environment, gathering information and informing other chiefs about the situations all around the area. He can vocally give information about fires and injured people to other trainees. Also, he can move the patients that medical had applied triage to triage regions so that they can be treated.

5.2 3D Environment of Simulation

Environment items are designated as buildings, and civilians. Buildings can be picked by users so that their information (name, population, number of stocks, fire existence...etc.) can be displayed. Fire-fighter chief may pick a building and use a resource on that building. Civilians can also be picked by the trainees. Their information includes their health situation (consciousness, pulse rate, respiration rate...etc.) Medical chief may pick a civilian and set his triage class, or use a resource on him.

5.3 Map

The simulation takes place on map of METU campus. While constructing the simulation map, METU campus is divided into three regions; according to their place and their structural properties:

1. Dormitories Area
2. Mall Area
3. Engineering Departments Area

There are limited numbers of buildings in each region. Also, each of these buildings has a certain predefined structure. The facilitator may be able to generate a scenario by changing the structures of these buildings at the beginning of the simulation.
6 Troubleshooting

➢ I have started the simulation, but the time on the right top corner does not change. What is the problem?

*Answer:* You could not connect to server. Make sure you have internet connection, and restart the simulation after.

➢ I am running the simulation, but I cannot hear or speak to other users.

*Answer:* You may have a problem with your microphone settings.